

PBEEEP

State Government

Public Buildings Enhanced Energy Efficiency Program

SCREENING RESULTS FOR RAINY RIVER COMMUNITY COLLEGE



April 19, 2011

Summary Table

Rainy River Community College	
Location	1501 Highway 71-Internatl Falls, MN 56649-2187
Facility Manager	Des Goulet
Number of Buildings	16
Interior Square Footage	114,685
PBEEEP Provider	Center for Energy and Environment (Gustav Brandstrom)
State's Project Manager	
Date Visited	January 12, 2011
Annual Energy Cost (from B3)	\$116,322.25 (2010)
Utility Company	MN Power (Electric), MN Energy Resources (Natural Gas)
Site Energy Use Index (from B3)	99.13 kBtu/sq ft (2010)
Benchmark EUI (from B3)	79.71 kBtu/sq ft

Screening Overview

The goal of screening is to select buildings where an in-depth energy investigation can be performed to identify energy savings opportunities that will generate savings with a relatively short (1 to 5 years) and certain payback. The screening of Rainy River Community College was performed by the Center for Energy and Environment (CEE) with the assistance of the facility staff. A walk-through was conducted on January 12, 2011 and interviews with the facility staff were carried out to fully explore the status of the energy consuming equipment and their potential for recommissioning. This report is the result of that information.

Rainy River Community College is a 114,685 square foot (sq ft) building located in International Falls, MN. The building consists of primarily office space

Recommendation for Investigation

Due to Rainy River's low energy use, scheduling of mechanical equipment, and operation of mechanical equipment CEE does not recommend any further investigation.

Building Name	State ID	Square Footage	Year Built
Humanities	E26155C0370	14,091	1970
Humanities Addition	E26155C1301	95	2001
Observatory	E26155C0780	320	1980
Administration Building	E26155C0170	1,064	1970
Heating Plant	E26155C0470	1,888	1970
Industrial Tech Building	E26155C0886	2,428	1986
Garage	E26155C14	2,697	1994

Classroom	E26155C1188	3,280	1988
Covered Walkway 1	E26155C0987	3,430	1987
Covered Walkway 2	E26155C1505	5,803	1987
Library	E26155C0570	6,362	1970
Science Building	E26155C0670	9,752	1970
Student Center	E26155C1087	12,009	1987
Student Service Building	E26155C1293	14,023	1993
Gym	E26155C0270	14,295	1970
Student Housing	E26155C5089	23,148	1993

Building Overview Section

Mechanical Equipment

Controls and Trending

Lighting

Energy Use Index B3 Benchmark

The site Energy Use Index (EUI) for the building is 99.13 kBtu/sqft, which is 24% above the B3 Benchmark of 79.71 kBtu/sqft.

Metering

The building contains two electrical meters and three natural gas meters.

Documentation

Occupancy

Mechanical Equipment Summary Table	
Quantity	Equipment Description
	Honeywell EBI Automation System
	Building
	Interior Square Feet (before 1,200 sqft addition)
	Air Handlers
	VAV Boxes (113 with reheats and 154 without)
	Fan powered VAV boxes
	FCUs
	Water to Water Heat Exchangers
	Hot Water Pumps
	Chilled Water Pumps
	Dry Coolers
	Pumps associated with glycol and CRAC units
	CRAC Units
	Hot water pumps for AHU coils
	CUHs
	HUHs
	VUHs
	Power Roof Ventilators
	Exhaust Fans
	Approximate number of points for trending

Building Summary Table

The following tables are based on information gathered from interviews with facility staff, a building walk-through, automation system screen-captures, and equipment documentation. The purpose of the tables is to provide the size and quantity of equipment and the level of control present in each building. It is complete and accurate to the best of our knowledge.

Admin Building State ID# E26155C0170					
Area (sqft)	1064	Year Built	1970	EUI/Benchmark	99/79
HVAC Equipment					
Air Handlers (7 Total)					
Description	Type	Size	Notes		
AHU 1	AHU	5945 cfm, 7.5 hp	Mech Room		
AHU 2	AHU	8267 cfm, 7.5 hp	Mech Room		
AHU 3					
HVAC Equipment Cont'd					
Fan Coil Units (3 Total)					
Description	Type	Size	Notes		
FC	Fan Coil Unit	1/20hp			
Fan and Heaters(x Total)					
Description	Type	Size	Notes		
Heater	Baseboard	1707 BTUH	500w		
Relief fan	Fan	3327 cfm, 3/4 hp			
Relief Fan	Fan	2618 cfm, 1/2 hp			
Relief Fan	Fan	4150 cfm, 1hp	Qty-2		
Chilled Water System					
Description	Type	Size	Notes		
Air cooled Liq chiller	Chiller	36.3 tons, 4@ 15hp, 4@ 1hp	On rooftop (alt 6)		
ChW Pump	Pump	118 gpm, 5hp	2 pumps, Mech Rm		
Hot Water System					
Description	Type	Size	Notes		
HW Heater	Heater-Qty-2	9 gph, 190 w	Flex classroom, and Nursing Lab		
HW Heater	Unit Heater	16.68 mbh, 2.65 gpm, 28.9amp	Mech Rm		
Unit Ventilators					
Description	Type	Size	Notes		
Fan		510 cfm, 1/5 hp	Serves Conference		
Fan		220 cfm, 1/10hp	Serves Men/Women's Toilet		
Fan		250 cfm, 1/50 hp	Serves Mech Room		

HVAC Equipment Cont'd

UH (x total)

Description	Type	Size	Notes
Cab-UH 1	Unit heater	1/30hp	
Cab Htr	Unit Heater	13.60 mbh, 1.36 gpm, 1/60	Vestibule
Cab Htr	Unit Heater	26.53 mbh, 2.65 gpm, 1/30	Vestibule

Misc (x total)

Description	Type	Size	Notes
Comb data/ tele outlet			15 count
Humidifier		64.2 lbs/hr, 1/20 hp	
Garage door opener		3/4	
Power Outlet		1kw	
Data Outlet		.36 kw	
Expansion Tank		13 gal	
Air Separator		118 gpm	
Portable Teset Meter			

Temp Control

Description	Type	Size	Notes
Temp Control	AC	¼ hp	
Temp Control	REF Unit	1/5 hp	
Temp Control	Air Compress	1/5hp	Mech Rm
Temp Control	Air Dryer	1.5kw	Mech Rm

HVAC Equipment Cont'd

Exhaust Fans (x Total)

Description	Type	Size	Notes
Ex 1	Exhaust Fan	1/6 hp	
Ex 2	Exhaust Fan	1/10 hp	
Ex 3	Exhaust Fan	1/50 hp	
Exh	Exhaust Fan	300 cfm, 150w	
Exh	Exhaust Fan	250 cfm, 150w	

Hot Water Coil Pumps (x Total)

Description	Type	Size	Notes
CP 4	Pump	3/4hp	
Heating pump	Pump	129.5gpm,3hp	Mech Rm- qty-2
Heating Pump	Pump	80 gpm,3hp	Existing Boiler Room

Humanities Building
State ID# E26155C0170

Area (sqft)	14091	Year Built	1970	EUI/Benchmark	99/79
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HVAC Equipment**Air Handlers (7 Total)**

Description	Type	Size	Notes
AHU 1	AHU	4500 cfm, 2 hp	Theatre
AHU 2	AHU	1200 cfm, 1/2 hp	Interior and windowless rms
AHU 3			
AHU 4			
AHU 5			
AHU 6			
AHU 7			

HVAC Equipment Cont'd

HUH (xtotal)

Description	Type	Size	Notes
Cab Unit Heater #4	Unit Heater	1/30 hp	
Cab Unit Heater #4	Unit Heater	1/30 hp	
Cab Unit Heater #5	Unit Heater	1/30 hp	
Blast	Unit Heater	1/30 hp	
Blast	Unit Heater	1/30 hp	
Blast	Unit Heater	1/30 hp	
H=V	Unit 2	2 hp	
H=V	Unit 3	½ hp	

Unit Ventilators (x total)

Description	Type	Size	Notes
Clssrm U-V		½ hp	
Toilet	Fan	12.5 cfm, 1/25 hp	H101
Toilet	Fan	125 cfm, 1/25hp	H123
Fan	Fan	220 cfm, 1/10 hp	Mech Rm
Fan	Fan	2110 cfm, 1/8 hp	Commons
Fan	Fan	220 cfm, 1/10 hp	H117
Fan	Fan	270 cfm, 1/10 hp	H112
Fan	Fan	125 cfm, 1/25hp	Janitor

HVAC Equipment Cont'd**Exhaust Fans (x Total)**

Description	Type	Size	Notes
Exh 18	Exhaust fans	1/25 hp	
Exh 19	Exhaust fans	1/25 hp	
Exh 20	Exhaust fans	1/10 hp	
Exh 21	Exhaust fans	1/3 hp	
Exh 22	Exhaust fans	1/10 hp	
Exh 23	Exhaust fans	1/10 hp	
Exh 24	Exhaust fans	1/10hp	

Hot Water Coil Pumps (10 Total)

Description	Type	Size	Notes
Pump CP 5	Pump	2 hp	
Pump CP 6	Pump	2 hp	
Pump CP 6	Pump	2 hp	
Pump CP8	Pump	1/10 hp	
Pump CP 9	Pump	1/10 hp	

Gymnasium State ID# E26155C0270					
Area (sqft)	14295	Year Built	1970	EUI/Benchmark	99/79
HVAC Equipment					
Air Handlers (7 Total)					
Description	Type	Size	Notes		
AHU 1	AHU	800cfm, 1/4hp	Interior and windowless rooms		
AHU	AHU	1800 cfm, 1 hp	Multipurpose room/gym		
AHU	AHU	10400 cfm each, 5 hp	Gym		

HVAC Equipment Cont'd			
CUH (x total)			
Description	Type	Size	Notes
Cab UH #6	Unit heater	1/25 hp	
Cab UH #6	Unit heater	1/25 hp	
UH (xtotal)			
Description	Type	Size	Notes
Vert UH#1	Unit Heater	1/25 hp	
Blast#2	UH	1/20 hp	
Blast#3	UH	1/5 hp	
H=W#4	UH	1 hp	
H=W#5	UH	5hp	
H=W #6	UH	5 hp	
Misc			
Description	Type	Size	Notes
Motorized Filter	Filter	1/6hp	
Motorized Filter	Filter	1/6 hp	
Temp Control	AC	¼ hp	
Temp Control	REF	1/5 hp	
Unit Ventilators (x total)			
Description	Type	Size	Notes
UV	Unit ventilators	1800 cfm, ¼ hp	Gym
UV	Unit Ventilators	7135 cfm, 1.5 hp	Blog Exh

HVAC Equipment Cont'd			
Exhaust Fans (xTotal)			
Description	Type	Size	Notes
Exh Fan #24	Exhaust Fan	¼ hp	
Exh Fan #25	Exhaust Fan	1 hp	
Pumps (x Total)			
Description	Type	Size	Notes
CP 7	Htg	2 hp	
CP 7	Htg	2 hp	
CP12	Htg	1/3 hp	
CP 10	HWT	1/8 hp	
CP 11	CHW	1/8 hp	

Science Building State ID# E26155C0670					
Area (sqft)	9752	Year Built	1970	EUI/Benchmark	99/79
HVAC Equipment					
Air Handlers (7 Total)					
Description	Type	Size	Notes		
AHU 1					
AHU 2					
AHU 3					
AHU 4					
AHU 5					
AHU 6					
AHU 7					
Fan Coil Units (3 Total)					
Description	Type	Size	Notes		
FCU	Fan Coil Unit	1/20hp			
HVAC Equipment Cont'd					

CUH (x total)

Description	Type	Size	Notes
Cab UH	Unit Heater	1/30 hp	
Cab UH	Unit Heater	1/30 hp	

VUH (x total)

Description	Type	Size	Notes
H=W 1	Unit Heater	¼ hp	

Misc

Description	Type	Size	Notes
Temp Control	AC	¼ hp	
Temp Control	REF	1/5 hp	
Compress	AC	1.5 hp	
ACU	Air Condition Unit	½ hp	

Unit Ventilators x total)

Description	Type	Size	Notes
Classroom	UV	1/8 hp	
Prep & Stor	UV	500 cfm, 1/5hp	
Womens	UV	200 cfm, 1/10 hp	
Men	UV	200 cfm, 1/10 hp	
Prep	UV	345 cfm, 1/10hp	
Plant	UV	175 cfm, 1/10 hp	
Mech Rm	UV	210 cfm, 1/10 hp	
Biology	UV	2000 cfm, 1/3hp	
Lecture	UV	2900 cfm, ½ hp	
Chemistry	UV	1220 cfm, ¼ hp	
Chem Lab	UV	1220 cfm, ¼ hp	

Library Building
State ID# E26155C0570

Area (sqft)	6362	Year Built	1970	EUI/Benchmark	99/79
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HVAC Equipment**Air Handlers (7 Total)**

Description	Type	Size	Notes
AHU 1			
AHU 2			

HVAC Equipment Cont'd

Fan Coil Units (3 Total)

Description	Type	Size	Notes
FCU	Fan Coil	120/1	

Misc

Description	Type	Size	Notes
Temp Control	AC	1/4 hp	
Temp Control	Ref	1/5hp	

CUH (x total)

Description	Type	Size	Notes
Cab UH 2	Unit Heater	1/30 hp	
Cab UH 3	Unit Heater	1/30 hp	

VUH (4 total)

Description	Type	Size	Notes

HUH (6 total)

Description	Type	Size	Notes
Blast 1	UH	1/20 hp	

Glycol and CRAC Room AC Units System

Description	Type	Size	Notes

Unit Ventilators (x total)

Description	Type	Size	Notes
Classroom	Unit Ventilator	1/8 hp	
Womens	UV	225 cfm, 1/10hp	
Men	UV	225 cfm, 1/10 hp	
Janitor	UV	170 cfm, 1/10 hp	
Mech Rm	UV	250 cfm, 1/50 hp	

HVAC Equipment Cont'd

Exhaust Fans (7 Total)

Description	Type	Size	Notes
Exh 4	Exhaust Fan	1/10 hp	
Exh 5	Exhaust Fan	1/10 hp	
Exh 6	Exhaust Fan	1/10 hp	
Exh 7	Exhaust Fan	1/10 hp	

Hot Water Coil Pumps (10 Total)

Description	Type	Size	Notes
CP3	Pump (Htg)	1 hp	

Points on BAS

Air Handlers

Description	Points

VAV Boxes

Description	Points

Chilled Water System

Description	Points

Exhaust Fans with VFDs

Description	Points

Points on BAS Cont'd

Fan Coil Units

Description	Points

Hot Water System

Description	Points

CUH

Description	Points

VUH

Description	Points

HUH

Description	Points

Glycol and CRAC Units

Description	Points

PRV

Description	Points

Generator Room Temperature Control

Description	Points

Heating Plant State ID# E26155C0420					
Area (sqft)	1888	Year Built	1970	EUI/Benchmark	99/79
HVAC Equipment					
Air Handlers (7 Total)					
Description	Type	Size	Notes		
AHU 1					
AHU 2					
AHU 3					
AHU 4					
AHU 5					
AHU 6					
AHU 7					
HVAC Equipment Cont'd					
VAV Boxes (265 Total)					
Description	Type	Size	Notes		
Fan Coil Units (3 Total)					
Description	Type	Size	Notes		
Fan Powered VAV Boxes (37 Total)					
Description	Type	Size	Notes		
Chilled Water System					
Description	Type	Size	Notes		
Hot Water System					
Description	Type	Size	Notes		

HVAC Equipment Cont'd

CUH (6 total)

Description	Type	Size	Notes
Cab UH 2	Unit Heater	1/30 hp	

VUH (4 total)

Description	Type	Size	Notes

HUH (6 total)

Description	Type	Size	Notes

Misc

Description	Type	Size	Notes
Blast 4	Unit Heater	1/8 hp	
Burner		3hp	
Burner		3 hp	

Ventilators (2 total)

Description	Type	Size	Notes
UV	Unit Ventilators	200 cfm, 1/10hp	Toilet

Exhaust Fans (7 Total)

Description	Type	Size	Notes
Exh 20	Exhaust Fan	1/10 hp	

Hot Water Coil Pumps (10 Total)

Description	Type	Size	Notes
CP-P1	Pump	3hp	
CP-P2	Pump	3hp	
CP-P3	Pump	3hp	
CP-1	Pump	½ hp	

Points on BAS

Air Handlers

Description	Points

VAV Boxes

Description	Points

Chilled Water System

Description	Points

Exhaust Fans with VFDs

Description	Points

Fan Coil Units

Description	Points

Hot Water System

Description	Points

CUH

Description	Points

VUH

Description	Points

HUH

Description	Points

Glycol and CRAC Units

Description	Points

PRV

Description	Points

Generator Room Temperature Control

Description	Points

PBEEEP Abbreviation Descriptions			
AHU	Air Handling Unit	HUH	Horizontal Unit Heater
BAS	Building Automation System	HRU	Heat Recovery Unit
CD	Cold Deck	HW	Hot Water
CDW	Condenser Water	HWDP	Hot Water Differential Pressure
CDWRT	Condenser Water Return Temperature	HWP	Hot Water Pump
CDWST	Condenser Water Supply Temp	HWRT	Hot Water Return Temperature
CFM	Cubic Feet per Minute	HWST	Hot Water Supply Temperature
CHW	Chilled Water	HX	Heat Exchanger
CHWRT	Chilled Water Return Temperature	kW	Kilowatt
CHWDP	Chilled Water Differential Pressure	kWh	Kilowatt-hour
CHWP	Chilled Water Pump	MA	Mixed Air
CHWST	Chilled Water Supply Temperature	MA Enth	Mixed Air Enthalpy
CRAC	Computer Room Air Conditioner	MARH	Mixed Air Relative Humidity
CUH	Cabinet Unit Heater	MAT	Mixed Air Temperature
CV	Constant Volume	MAU	Make-up Air Unit
DA	Discharge Air	OA	Outside Air
DA Enth	Discharge Air Enthalpy	OA Enth	Outside Air Enthalpy
DARH	Discharge Air Relative Humidity	OARH	Outside Air Relative Humidity
DAT	Discharge Air Temperature	OAT	Outside Air Temperature
DDC	Direct Digital Control	Occ	Occupied
DP	Differential Pressure	PTAC	Packaged Terminal Air Conditioner
DSP	Duct Static Pressure	RA	Return Air
DX	Direct Expansion	RA Enth	Return Air Enthalpy
EA	Exhaust Air	RARH	Return Air Relative Humidity
EAT	Exhaust Air Temperature	RAT	Return Air Temperature
Econ	Economizer	RF	Return Fan
EF	Exhaust Fan	RH	Relative Humidity
Enth	Enthalpy	RTU	Rooftop Unit
ERU	Energy Recovery Unit	SF	Supply Fan
FCU	Fan Coil Unit	Unocc	Unoccupied
FPVAV	Fan Powered VAV	UH	Unit Heater
FTR	Fin Tube Radiation	VAV	Variable Air Volume
GPM	Gallons per Minute	VFD	Variable Frequency Drive
HD	Hot Deck	VIGV	Variable Inlet Guide Vanes
HP	Horsepower	VUH	Vertical Unit Heater

Conversions:

1 kWh = 3.412 kBtu

1 Therm = 100 kBtu

1 kBtu/hr = 1 MBH